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(54) Movement mechanism particularly for toys

Bewegungsmechanismus insbesondere für Spielzeuge

Mécanisme de mouvement particulièrement pour jouets

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WO-A-92/21416 GB-A- 2 163 059
US-A- 2 641 864

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Description

[0001] The invention relates to a movement device for toys, particularly for moving the legs of a puppet or a doll with an alternating angular movement, so as to simulate walking of the type disclosed, for instance, in US-A-2,641,864 which comprises a body rotatable around a rotation axis, said body comprising a drive wheel and drive rods, each rod being constrained to make an angular movement by means of a fulcrum in a fixed position. More particularly, the invention relates to a device particularly suitable for moving the legs of dolls of the flexible (so-called "flexy") type, i.e. without joints.

[0002] In the field of movements for toys there is constant tendency to create movement devices that are simple, easy to assemble, occupy little space, have a low cost and are nevertheless efficient.

[0003] In particular, for dolls of the "flexy" type, like those widely sold at present on the market, considerable difficulty is encountered in creating a movement device that can be housed in the small space available inside the doll and yet work efficiently.

[0004] A further aim is to create such a device with low production costs.

[0005] Said aims have been achieved with the device forming the subject-matter of the application as described in claim 1. Further characteristics are stated in the subsequent claims.

[0006] The new device comprises a body rotating around an axis, this body consisting of a drive wheel that bears two eccentric pulleys on opposite faces, said pulleys being integral with the wheel and offset in position to each other, generally by 180°. A control or drive rod is bound to each pulley, so that one end of said rod can revolve freely on the pulley, though being pulled by the pulley in its rotational movement around the axis of the drive wheel. The drive wheel meshes with a worm screw driven by a motor. The constraint between a rod and the relative pulley is preferably created by making the rod of metal wire with a part curved to form a loop or ring that fits in a groove in the pulley, so as to be able to slide circumferentially in said groove.

[0007] The new device comprises few parts that can be produced at a low cost and easily assembled, so that they have a limited production cost. These and other advantages and characteristics will be made clear by the detailed description given below, of a preferred but non-limiting exemplary embodiment, with reference to the attached drawings in which:

- Figure 1 is a front part-sectional view of the device, shown in a body of a doll, which has been diagrammatically drawn in phantom.
- Figure 2 is a side view of the device, from the left in Figure 1, with one supporting plate removed.
- Figure 3 is an exploded perspective view of the device, enlarged with respect to the preceding

figures, in which for clarity's sake the motor and the drive worm screw as well as one of the supporting plates have been omitted.

[0008] With reference to the drawings, a movement device for toys is indicated as a whole by reference number 10 and comprises a rotatable body 12 rotatably supported, by means of coaxial pins 13, 14 between facing supporting plates indicated by 15 and 16. The rotatable body essentially comprises a drive wheel 18, generally peripherally toothed, on one side and the other of which respective pulleys 20, 22, are integral. Each pulley is eccentric with respect to said toothed wheel, that is to say the centre of the pulley 20 is situated on an axis b and the centre of the pulley 22 is placed on an axis c. The axes b and c are parallel and angularly offset around the axis a, preferably by 180° that is to say, the axes a, b and c are preferably coplanar. Each pulley has a radius greater than the distance between its center axis and the axis a. A drive rod is bound to each pulley; the drive rod bound to pulley 20 will be indicated by 24 and the drive rod bound to pulley 22 will be indicated by 26. Each rod and relative pulley are bound such that an end of each rod 24, 26 is freely sliding on a circumference of the respective pulley. Said binding or constraint can be effected in any suitable way, for example by constraining one end of each rod to a ring free to rotate in a path, e.g. a groove, 20', 22' respectively, of each pulley. According to a preferred embodiment of the invention, each rod is made of piano wire, as can be seen in figure 3, bent to form a loop or ring at one end, for example as illustrated in 27 for the rod 26, and the ring is received in the respective groove, for example 22', of the pulley 22. It will be noted that in this manner the unit formed by the body 12 and each rod 24, 26 forms a connecting rod-crank assembly. A further constraint for each rod 24, 26 is provided by a "fulcrum" 30, 32 respectively, consisting of a through hole 34 in a respective block 36, 38. The fulcrum 30 is integral with the plate 16 and the fulcrum 32 with the plate 15. Each fulcrum binds the relative rod to an oscillating lever-like movement whose fulcrum is precisely in the narrow part of the respective hole. Thus the rods 24, 26 have an angular movement offset with respect to each other, or a scissors-like movement, which can simulate a walking movement of two legs of a toy, indicated as a whole by the reference letter G in the figures. The device is made integral with the body of the toy through plates 15, 16; the drive wheel or worm wheel 18 is driven by a motor 40, which operates a worm screw 42 that meshes with the peripheral toothing of the wheel 18.

[0009] Batteries supplying the motor are not drawn and can be located in a suitable position, possibly contained within a backpack (not shown) on the back of the toy or doll.

[0010] Obviously variations and changes can be made to what is described without departing from the scope of the present invention, as defined in the ap-

pending claims.

Claims

1. A movement device for toys comprising a body (12) rotatable around a rotation axis (a), said body comprising a drive wheel (18) and drive rods (24,26) each rod being constrained to make an angular movement by means of a fulcrum (30,32) in a fixed position, characterized in that it includes pulleys (20,22) which are integral with said wheel, eccentric with respect to the same and angularly offset around the axis of the wheel, said drive rods (24, 26) each being constrained to one of said pulleys so as to have a part that slides on a path thereof.
2. A device according to claim 1, characterised in that said pulleys (20, 22) have an extension that comprises a center of rotation (a) of the drive wheel (12).
3. A device according to claim 1, characterised in that a rod and the relative pulley are bound by means of a loop or ring (27) received in a revolving manner on a circumference of the pulley, one end of the rod being constrained to said loop or ring.
4. A device according to claim 3 characterised in that each rod (24, 26) has one end bent over to form said loop or ring (27).
5. A device according to claim 1, characterised in that said fulcra consist of blocks (36, 38) in a fixed position, with a hole through which the respective rod passes.
6. A device according to claim 1, characterised in that it comprises a drive motor (40) that operates a worm screw (42), and said drive wheel (18) is a worm wheel meshing with said worm screw.
7. A device according to claim 1, characterised in that it comprises at least one plate for support and fixing to the toy, which carries the rotation axis (a) of said revolving drive wheel, said fulcra (30, 32) for the rods, and said motor (40).
8. A puppet or doll characterized in that it comprises a device according to claim 1, to move the legs.
9. A puppet or doll according to claim 8, characterized in that it is of the flexible type without joints.

Patentansprüche

1. Bewegungsmechanismus für Spielzeuge mit einem um eine Rotationsachse (a) drehbaren Körper (12),

der mit einem Antriebsrad (18) und Antriebsstangen (24, 26) versehen ist, wobei jede Stange mit Hilfe eines in einer festen Lage stehenden Drehpunktes (30, 32) zu einer Winkelbewegung gezwungen wird, dadurch gekennzeichnet, dass Rollen (20, 22) vorgesehen sind, die einstückig mit dem Rad ausgebildet, aber exzentrisch zu demselben angeordnet und im Winkel um die Achse des Rades versetzt zueinander sind, und dass die Antriebsstangen (24, 26) jeweils einer der Rollen so aufgezwungen sind, dass ein Teil auf einer Bahn derselben gleitet.

2. Mechanismus nach Anspruch 1, dadurch gekennzeichnet, dass die Rollen (20, 22) eine Ausdehnung besitzen, die über das Rotationszentrum (a) des Antriebsrades (12) reicht.

3. Mechanismus nach Anspruch 1, dadurch gekennzeichnet, dass eine Stange und die zugeordnete Rolle mit Hilfe einer Schleife oder eines Ringes (27) untereinander verbunden sind, die sich am Umfang der Rolle dreht, wobei ein Ende der Stange fest mit der Schleife oder dem Ring verbunden ist.

4. Mechanismus nach Anspruch 3, dadurch gekennzeichnet, dass jede Stange (24, 26) ein Ende aufweist, das zur Bildung der Schleife oder des Ringes (27) umgebogen ist.

5. Mechanismus nach Anspruch 1, dadurch gekennzeichnet, dass die Drehpunkte aus fest angeordneten Blöcken (36 38) bestehen, die mit einem Loch versehen sind, durch das sich die zugeordnete Stange erstreckt.

6. Mechanismus nach Anspruch 1, dadurch gekennzeichnet, dass ein Antriebsmotor (40) vorgesehen ist, der eine Schnecke (42) antreibt und dass das Antriebsrad (18) ein Schneckenrad ist, das mit der Schnecke in Eingriff steht.

7. Mechanismus nach Anspruch 1, dadurch gekennzeichnet, dass mindestens eine Platte zum Tragen und zum Befestigen am Spielzeug vorgesehen ist, welche die Drehachse (a) des rotierenden Antriebsrades, die Drehpunkte (30, 32) für die Stangen und den Motor (40) trägt.

8. Marionette oder Puppe, dadurch gekennzeichnet, dass sie einen Mechanismus nach Anspruch 1 zur Bewegung der Beine aufweist.

9. Marionette oder Puppe nach Anspruch 8, dadurch gekennzeichnet, dass sie biegsamer Art ohne Gelenke ist.

Revendications

ticulations.

1. Dispositif de mouvement pour des jouets comportant un corps (12) pouvant tourner autour d'un axe de rotation (a), ledit corps comportant une roue menante (18) et des tiges d'entraînement (24, 26), chaque tige étant obligée à effectuer un mouvement angulaire au moyen d'un point d'appui (30, 32) dans une position fixe, caractérisé en ce qu'il comporte des poulies (20, 22) qui sont formées d'une seule pièce avec ladite roue, excentrées par rapport à celle-ci et décalées angulairement autour de l'axe de la roue, lesdites tiges d'entraînement (24, 26) étant retenues chacune sur l'une desdites poulies afin d'avoir une partie qui glisse sur un chemin de celle-ci. 5- 10 15
2. Dispositif selon la revendication 1, caractérisé en ce que lesdites poulies (20, 22) comportent une saillie qui comprend un centre de rotation (a) de la roue menante (12). 20
3. Dispositif selon la revendication 1, caractérisé en ce qu'une tige et la poulie relative sont liées au moyen d'une boucle ou d'un anneau (27) reçu d'une manière pouvant effectuer une révolution sur une circonférence de la poulie, une extrémité de la tige étant solidarisée à ladite boucle ou audit panneau. 25
4. Dispositif selon la revendication 3, caractérisé en ce que chaque tige (24, 26) comporte une extrémité recourbée pour former ladite boucle ou ledit anneau (27). 30
5. Dispositif selon la revendication 1, caractérisé en ce que lesdits points d'appui sont constitués de blocs (36, 38) dans une position fixe, traversés d'un trou dans lequel la tige respective passe. 35
6. Dispositif selon la revendication 1, caractérisé en ce qu'il comporte un moteur d'entraînement (40) qui actionne une vis sans fin (42), et ladite roue menante (18) est une roue de vis engrenant avec ladite vis sans fin. 40 45
7. Dispositif selon la revendication 1, caractérisé en ce qu'il comporte au moins une plaque destinée à un support et à une fixation au jouet, qui porte l'axe de rotation (a) de ladite roue menante rotative, lesdits points d'appui (30, 32) pour les tiges et ledit moteur (40). 50
8. Marionnette ou poupée, caractérisée en ce qu'elle comporte un dispositif selon la revendication 1 pour déplacer les jambes. 55
9. Marionnette ou poupée selon la revendication 8, caractérisée en ce qu'elle est du type souple sans ar-

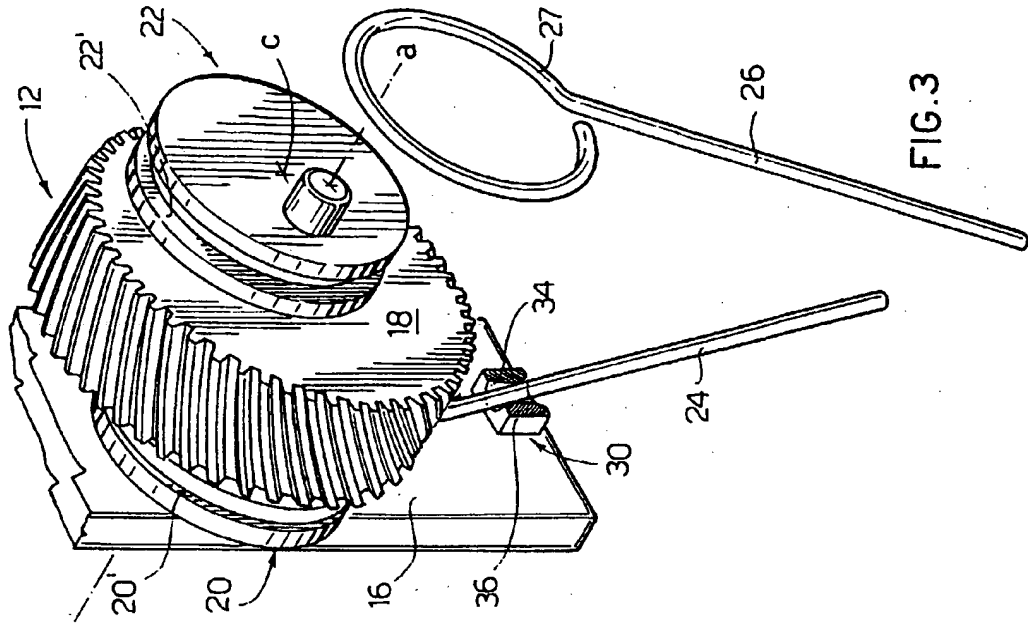


FIG. 3

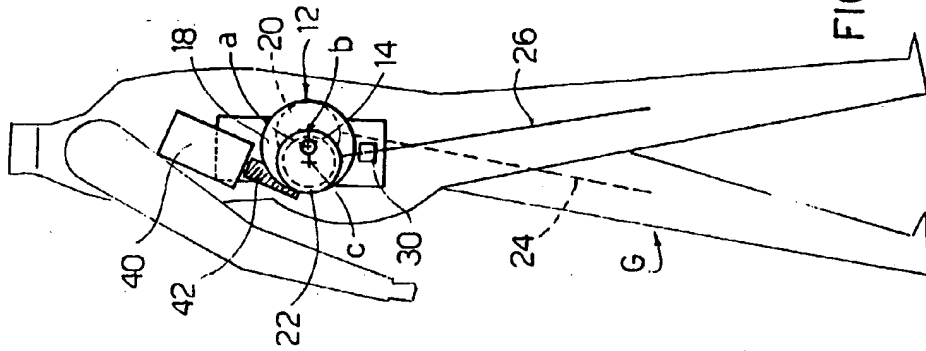


FIG. 2

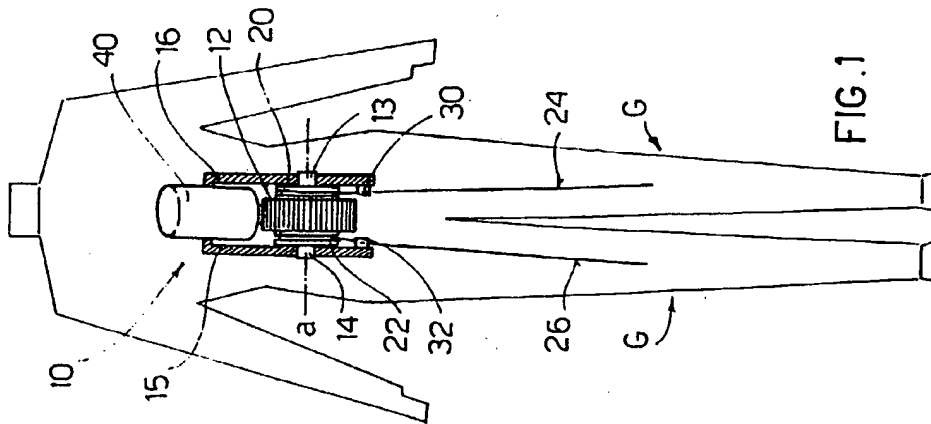


FIG. 1

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